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1. Hologeny. From the fertilized egg but one individual takes its rise, with or without metamorphosis. Hypogenesis (Haeckel).

2. Merogeny. From the fertilized egg two or more individuals are developed, which,—

A. Revert directly to the form and manner of reproduction of the parent. Temnogenesis.

B. Develop into individuals which become different, or a series of generations, varying in their mode of development (alternation of generations, metagenesis).

a. Calycogenesis (Salpa, Medusæ).

b. Paidogenesis (Cecidomyia).

c. Heterogenesis, in which either both generations are sexually reproduced, or one or several are reproduced parthenogenetically.

The peculiar type of reproduction called "temnogenesis" by Von Jhering, and characteristic of *Praopus hybridus*, leads to the somewhat paradoxical conclusion that the mother may become the grandmother of her own child, in virtue of the segmentation of the ovule into a number of distinct germs, which lead to the development of as many distinct individuals of the same sex. The same thing apparently occurs when in the human subject twins are invested by a common chorion. The subject, however, needs further investigation, especially since the researches of Dareste, Fol, Kleinenberg, and especially of Rauber, have so greatly extended the views of Lereboullet in respect to the mode of origin of double monsters among vertebrates or pleuro-gastric types. That the production of double monsters occurs among hypogastric types in essentially the same way as in the vertebrates seems to be pretty conclusively established by Mr. Ryder's observations upon double monstrosities among lobster embryos.

ANTHROPOLOGY.

Chinese Jade in America.—In the "Proceedings of the American Antiquarian Society," vol. iv. p. 62, Mr. Frederick W. Putnam makes a report of jade objects which have a double interest. Twelve specimens are reported from Nicaragua and Costa Rica, ten of which were ornaments made by cutting celts into halves, quarters, or thirds, a portion of the cutting edge of the celt remaining on each piece. The method of sawing the objects is indicated. The first query, therefore, is, For what reason should a celt of such hard material be cut up and perforated? Let us suppose that the original blade belonged to the outfit or accoutrement of a celebrated warrior, hunter, or artist. The pieces of that blade would become powerful medicine or influential fetishes and highly prized.

Greater astonishment is excited when we read the report of Mr. O. W. Huntington upon the nature and source of the material in these ornaments. It is as follows: "The specimens

which you left with me are unquestionably Chinese Jade, having all the characters of that mineral, although the largest specimen from Costa Rica is rather unusual in its color, and would not be taken for jadeite at sight."

No. 33,395, Costa Rica, H. = 7. Sp. gr. on 166 grms., 3.281. A small fragment before the blow-pipe fused readily below 3 to a glassy bead.

No. 33,391, Costa Rica, H. a little under 7. Sp. gr. on 54½ grms., 3.341. Fused quietly below 3 to transparent glass, not acted on by acid.

No. 32,794, Costa Rica, H. a little under 7. Sp. gr. on 13 grms., 3.326. Fused quietly below 3 to a transparent glass, not acted on by acid.

The day has gone by for hasty conclusions, and Professor Putnam would be one of the last to jump at one. The NATURALIST will shortly give account of evidences of connection of Costa Rica with Polynesia by means of a witness in another kingdom of nature. It will now be in order to collate during the next ten years the evidence for and against contact between the Orient and the western shores of America which will speak for itself.

Ornaments on Pottery.—It is thought by some that ornamental patterns on pottery are handed down by savages from one generation to another. This is not true of our Indian, who, after making a pot, ornaments it with improvised designs. He has no pattern-books to guide him.

Indians of New Mexico accustomed to pottery-making have, since their contact with whites, given attention to more elaborate ornamentation; just as those of Mexico meet a demand and find their way into public and private collections. The most noticeable change in technique is the use of animal and human forms, which, though not unknown on older pieces, are rare.

Toy forms of pottery and those animal and human designs which met the readiest sale have been most improved by a kind of natural selection.

The thirst for antiquities has also stimulated the native artists to imitate them. In the city of Mexico an Italian made a good living for three years making stone sculptures in imitation of antiquities. The writer saw some of his works, but they were easily detected. The children all had European faces, and the delicate parts of the body were too well worked out.

Near the city of Mexico live a settlement of Indians who have the credit of manufacturing clever imitations of ancient pottery.

The noble custom of exciting in children the love of the beautiful through toys and dolls was not neglected by the ancient Mexicans. Even at our day a striking example is the manufacture of toys in great profusion at Guadalajara, which are sold not only throughout the republic but outside.

They are taken on the backs of men and animals, packed in baskets and crates. These toys are very truthful representations of the manners and customs of the people. For the rude apparatus employed they are truly remarkable. The most interesting fact about this ware is the way in which the artist holds on to ancient forms, and in the decoration yields himself absolutely to the whims and demands of the market. He even borrows from the Spaniard the art of silvering and gilding.

This almost total hiding of the old thing which they are unwilling to give up, with paint and forms to which their old art was a stranger, is also seen in their gourd vessels.

The pitchers from Toluca, once simple unnozzled vessels, are lost in the large spouts, altered handles, polished surface, elaborate decoration, glazing, and stamping.

Still one may visit regions in Mexico where the old art still survives. The Pames, near the Valle del Maiz, and the Huastecas, the Indians of Sierra Nola and of Savanito, away from the influence of innovations, make their pottery as of old, simple in form and decoration.—*Edward Palmer.*

Head-flattening.—Dr. R. W. Shufeldt, U.S.A., contributes to the *Journal of Anatomy and Physiology* a paper on the skull of a Navajo child. The most interesting feature of this skull is the marked parieto-occipital flattening. The plane is somewhat oblique, and there is not only a flattening but a gentle depression over the entire area involved. The bones flexed are the two parietals from a little in front of the obelion, and almost the whole of the supra-squamous portion of the occipital. Dr. Shufeldt has not seen a Navajo skull lacking this feature. Navajo women carry their children about strapped on a stiff cradle-board, with only a small, narrow pad beneath the occiput. However, it is only the infants of a few months of age that have their heads bound down closely to the backboard of their portable cradles. Just as soon as they are able to support their heads and have acquired sufficient strength to control the movements of this part of the body, they are at once allowed considerable more latitude in this particular. Indeed, in the case of children who range from six months, or at the most eight months, of age, and upwards, I have never observed that the Navajo mothers strap their children's heads at all. If the strapping of the head during these first few months of infant life is sufficient to produce this lasting deformity, then the problem is surely solved once for all.

Love and Anthropology.—Professor Paolo Mantegazza has published in Milan two volumes on love among the different races of men, which have been reviewed in several foreign magazines. Following his example, Dr. D. G. Brinton has laid the tender passion upon the dissecting-table, and given to the world the result of his work in a paper read before the American Philo-

sophical Society on the 5th November, based upon one of Carl Abel's "Linguistic Essays" (London, 1882).

The key-note of Dr. Brinton's study is in his second paragraph, in which he says, "I shall give more particular attention to the history and derivation of terms of affection as furnishing illustrations of the origin and growth of those altruistic sentiments which are revealed in their strongest expression in the emotions of friendship and love.

"Upon these sentiments are based those acts which unite man to man in amicable fellowship, which bind parent to child and child to parent, which find expression in loyalty and patriotism; which, exhibited between the sexes, direct the greater part of the activity of each individual life, mould the form of social relations, and control the perpetuation of the species; and which have suggested to the purest and clearest intellects both the most exalted intellectual condition of man, and the most sublime definition of divinity."

In the Old World and in the New, Dr. Brinton finds the principal words expressing love in one of two ruling ideas, the one intimating similarity between those loving, the other a wish or desire. The former conveys the notion that the feeling is mutual, the latter that it is stronger on one side than on the other.

A third class of words of later growth combines the two sentiments into the loftiest terms of affection.

The existence of these forms of expression is traced through the Algonquin, Nahuatl, Maya, Qquichua, and Tupi-Guarani stocks with the following general results:

1. The original expression of love as revealed in the languages of those people was as follows:

1. Inarticulate cries of emotion (Cree, Maya, Qquichua).
2. Assertions of sameness or similarity (Cree, Nahuatl, Tupi, Arawack).
3. Assertions of conjunction or union (Cree, Nahuatl, Maya).
4. Assertions of a wish, desire, or longing (Cree, Cakchiquil, Qquichua, Tupi).

Loochoo, sometimes written **Liuchiu**, and called by the Japanese **Riukiu**, is the chief island of a group lying in the North Pacific Ocean between the 24th and 29th parallels of latitude, and forming a chain extending from Formosa to the southernmost extremity of Japan. The Chinese accounts state that the island of Loochoo was discovered by an exploring expedition sent out by the Emperor Yang Kwang, of the Sui dynasty (A.D. 608), which brought back to China one of the inhabitants. It was subsequently visited more than once by the Chinese, and early in the fourteenth century one of the emperors of the Ming dynasty sent some thirty Chinese families to Loochoo to civilize the natives, and teach them the arts and customs of China. Each

king of Loochoo, upon his accession to the throne, sent special envoys to announce the fact to the emperor, and to ask that commissioners be sent to confer investiture upon the new king. This was always acceded to, and the reports of some of the commissioners have been published in China and Japan, which are exceedingly well written and illustrated. The king of Loochoo always used as his seal of state one conferred upon him by the Chinese emperor. He also sent envoys at stated times to bear tribute and congratulations to the emperor, who generously allowed them to bring with them a certain number of the sons of the Loochooan nobles to be educated, at the emperor's expense, in the Kwo tsi Kien, or National College, at Peking. This state of things continued until after the change in the Japanese government, in 1868, when it was put to an end by the Japanese. The Japanese first became acquainted with the Loochooans A.D. 1451, when certain Loochooans brought a present of one thousand strings of cash (or Chinese copper coins) to the ruling Shogun, and from this time the Loochooans traded frequently to Hiogo and Kagoshima. Their relations to Japan were always of a most friendly character, and their vessels came very frequently bearing presents. But, A.D. 1609, Iyehisa, prince of Satsuma, fitted out an expedition to Loochoo, captured the king, and brought him prisoner to Kagoshima. He was released at the end of three years, although the Japanese could not succeed in inducing him to abjure his allegiance to the emperor of China, yet compelling him to pay an annual tribute to the prince of Satsuma, as the Japanese histories say, and forbidding him to inform the Chinese of the fact. From this time until 1868, the Loochooans continued to pay tribute both to China and Japan. When Commodore Perry wished to insert some provisions relating to Loochoo in his treaty with the Shogun ("tycoon"), the latter was unable to accede to Perry's wish, as the Shogun had no jurisdiction, Loochoo being considered by the Japanese as a dependency of the prince of Satsuma, and Commodore Perry (and after him the Hollanders) concluded a separate convention with the king or regent of Loochoo. After the surrender, in 1871, by the Japanese feudal princes to the Mikado of their territorial powers and possessions, the Imperial government, claiming Loochoo as a former dependency of the Prince of Satsuma, commenced to introduce more and more Japanese laws and regulations into Loochoo; and finally, in 1879, notwithstanding the earnest remonstrances of the Loochooan king's envoys, who appealed for aid to the Chinese minister in Tokio, as well as to our own minister, the Hon. John A. Bingham, the Japanese dethroned the king of Loochoo, and brought him with his family to Tokio, where he now is receiving a pension from the Japanese government, who have supplanted the native Loochooan officers and laws by Japanese officials and the Japanese code,

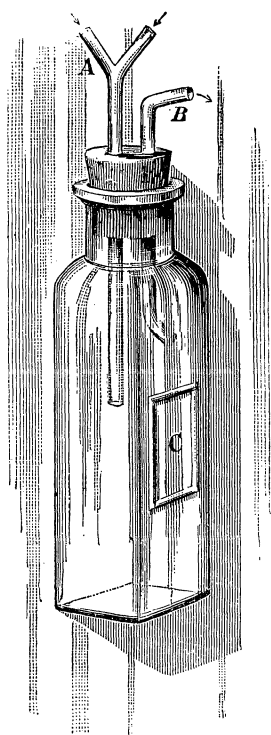
and have prohibited the Loochooans from paying tribute to China or from holding commercial intercourse with that country. The course pursued by Japan was deeply resented by China, and war between the two countries seemed for a while highly probable. Prince Kung and the viceroy Li Hung Chang requested General Grant to act as mediator, but the Japanese were unwilling to submit the case to arbitration, and the question still remains unsettled, and prevents the existence of anything like cordiality between the governments of China and Japan.—*D. Bethune McCartee, M.D.*

MICROSCOPY.¹

Orienting Objects in Paraffine.—In the *Zool. Anz.*, No. 199, Selenka has described a method of keeping paraffine melted while the contained small objects are being arranged under the microscope in any desired position, and then of rapidly cooling the paraffine without disturbing the position of the objects.

Finding it difficult to make tubes such as he describes, which should be of such shape as to admit of removing the hardened paraffine readily, and at the same time with depressions of sufficient size for any but very minute objects, I have made use of the following simple device, which, though more clumsy than the tube of Selenka, can be used for objects 1 mm. long and much larger, while giving a block of paraffine of very regular shape and with rectangular sides.

A common flat medicine-bottle is fitted with a cork through which two tubes pass, or if the mouth is small one tube may be fastened into a hole drilled into the bottle. One of these tubes (*A*) is connected with hot and cold water; the other (*B*) is a discharge-pipe for the water entering the bottle by (*A*), and raising or lowering its temperature as warm or cold water is allowed to flow in. On the smooth flat side of the bottle four pieces of glass rods or strips are cemented fast so as to enclose a rectangular space (*C*) which forms a receptacle for the melted paraffine. As long as the warm water circulates through the bottle the paraffine remains fluid, and objects in it may be arranged under the microscope by light from above or below, and



¹ Edited by Dr. C. O. WHITMAN, Milwaukee.